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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

UHLIR, NIKOLAS J

ART UNIT	PAPER NUMBER
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1773

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DATE MAILED: 04/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,896

Applicant(s)

IKEGAWA ET AL.

Examiner

Nikolas J. Uhler

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 06/06/2000. It is noted, however, that applicant has not filed a certified copy of the 2000-168461 application as required by 35 U.S.C. 119(b).

Specification

2. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because the examination as amended is extremely difficult to read and comprehend. The applicant filed a preliminary amendment to the specification on 8/3/01 to correct numerous errors to the specification and to remove references to drawings not included with the application. Because of the sheer number of errors, the specification as written is extremely difficult to read and comprehend, as the examiner is forced to jump from the amended specification to the original specification constantly.

A substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

Claim Rejections - 35 USC § 112

Art Unit: 1773

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the instant case, the applicant in claim 1 claims a base resin comprising a thermoplastic **and** a thermosetting resin. However, in claims 2 and 3, the applicant claims a base resin that is made up of 1 **or** 2 **or** more resins. It is unclear to the examiner how if only 1 resin is selected from the groups of polymers disclosed in claims 2 or 3 how the limitations present in claim 1 for the base resin can be met. On page 9 of the specification, the applicant discloses that the base resin can be a thermoplastic **or** a thermosetting resin whereas on page 11, beginning with the 6th line from the bottom, the applicant discloses that a mixture of resins can form the base resin. In the instant case, replacing the phrase "base resin comprising a thermoplastic resin and a thermosetting resin" in claim 1 with "base resin comprising a thermoplastic resin **or** a thermosetting resin **or** a mixture thereof" would be sufficient to overcome this rejection. Correction is required.

5. Claims 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the instant case in claims 12 and 14 the applicant requires that the resin further contain "unshaped" powdery filler material. The term "unshaped" is not defined by the specification and is not well defined in the art. Thus one of ordinary skill would not be apprised of the metes and bounds of these claims.

Art Unit: 1773

Further, it is unclear to the examiner how any particle can be "unshaped," as even irregular/non-geometric particles have some structural definition. Clarification is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

7. Claims 1, 2, 6, 7, 9, 10, 12, 13, and 15 rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (US5474853).

For the purpose of this examination the examiner has assumed that the base resin as claimed in claim 1 can comprise a thermoplastic resin or a thermosetting resin or a mixture thereof. This statement applies to all of the rejections made below.

The limitation "activated by the plasma treatment by any method selected from sputtering method, a vacuum depositing method and an ion plating method" in claim 1 is a product-by-process limitation and is does not appear to be further limiting in so far as the structure of the product is concerned. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the

Art Unit: 1773

product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113. This statement applies to all of the rejections made below.

8. Watanabe et al. teaches a resin composition for producing a molded article, wherein the resin composition comprises a specific amount of a polyamide resin, a modified polyphenylene ether resin, a fibrous inorganic filler having a specific average particle diameter, a powdery inorganic filler having a specific particle diameter, an epoxy resin, and a copper compound (column 2, lines 42-56). The specific polyamide resin is a MX nylon formed from xylenediamine and an α, χ -linear aliphatic dibasic acid (column 3, lines 28-41). In addition polyamide 66 may be used in combination with the MX nylon, to reduce the molding cycle (column 3, lines 45-51). The fibrous inorganic filler is typically selected from potassium titanate whiskers, aluminum borate whiskers, titanium oxide whiskers, and glass fibers (column 5, lines 45-50). If selected, the potassium titanate whiskers have an average diameter between .1-5 μm and an average fiber length between 1-100 μm . If aluminum borate whiskers are selected, they have an average diameter less than 3 μm and an average length between 10-100 μm (column 6, lines 6-19). The resin composition typically contains between 5-60 parts by weight of the fibrous filler (column 3, lines 10-15). The powdery inorganic filler is typically selected from mica, talc, glass beads, wallastonite, and calcium carbonate. Glass is well known

Art Unit: 1773

to be made of silica, and so the limitations of claim 15 are necessarily met. This filler typically has an average diameter of less than $10\mu\text{m}$ (column 6, lines 35-43). The resin composition typically contains between 20-180 parts by weight of the powdery filler. The resin composition can be injection molded when it is melted to give a molded article. Lastly, this molded article can have a metal film formed on its surface that is formed by vapor or sputter deposition. Typical metals include aluminum, chromium, and nickel (column 9, lines 6-16).

9. Claims 1-3, 5-6, 8-9 rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (US4943606).

10. Inoue et al. teaches a resin composition for printed circuit boards that comprises 30-90% by weight liquid crystal polyester, 3-50% by weight of an inorganic fibrous or acicular material, and 3-30% by weight of an alkaline earth metal carbonate (column 2, lines 46-51). The liquid crystal is not amorphous but anisotropic even in a molten state (column 2, lines 53-55). Thus, although Inoue et al. does not disclose that this liquid crystal is a melt type liquid crystal, because the liquid crystal polyester can exist in molten form, the examiner takes the position that this limitation is necessarily met. The fibrous inorganic material is typically selected from glass fibers, wallastonite and potassium titanate fibers (column 6, lines 33-46). The potassium titanate fiber has an ordinary fiber diameter between $.1\text{-}10\mu\text{m}$ and a length between $10\text{-}120\mu\text{m}$ (column 6, lines 51-60). In examples 1 to 10 (column 12), Inoue et al. discloses that the wallastonite fibers used have a diameter of less than $10\mu\text{m}$ and a length less than $50\mu\text{m}$. The resin composition can further comprise at least one thermoplastic resin in

Art Unit: 1773

small amounts (column 8, lines 22-28). This composition can be formed into a molded article, which is then plated (column 8, lines 29-36). Column 8, line 39-column 9, line 19 describes a procedure for plating copper metal onto a molded article of this composition.

11. Claims 1, and 7-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Okano et al. (US5965245).

12. Okano et al. teaches a prepreg for printed circuit boards comprising a thermosetting resin, electrically insulating whiskers dispersed throughout the resin, and optionally a carrier film (column 2, lines 55-59). Okano et al. teaches several embodiments, most notably embodiment "C" and embodiment "D." In embodiment "C," the thermosetting resin is a film forming resin such as epoxy resins and polyimide resins (column 5, lines 35-41). Okano et al. teaches in embodiment "D" a composition wherein the thermosetting resin is a non film forming resin selected from epoxy resins, polyamide resins, polyimide resins, and unsaturated polyester resins (column 7, lines 28-33). The fibers used in both embodiments are typically selected from aluminum borate whiskers, potassium titanate whiskers, and wallastonite whiskers, wherein the whiskers have a average diameter between .3-3 μ m and an average length preferably less than 50 μ m (column 4, line 34-column 5, line 11). These whiskers are typically added in an amount between 5-50% by volume (column 6, lines 16-30). Okano et al. in examples 1, 2, and 3 teaches that 36, and 90 parts by weight of aluminum borate whiskers are added to the resin mixture. Although Okano et al. does not teach a % by weight loading for wallastonite or potassium titanate fibers, the examiner takes the

Art Unit: 1773

position that due to the wide % by volume loading range, the % by weight loading requirement required by claim 1 is necessarily met. Both of the resin compositions disclosed in embodiment "C" and embodiment "D" are laminated to a copper foil to form a material suitable for use as a printed circuit board (column 7, line 65-column 8 line 35 and column 9, line 45-column 10, line 29). Lastly, these compositions can contain additives such as coupling agents and fillers if necessary (column 8, lines 12-14) and column 10, lines 1-3).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 4, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okano et al. in view of Bersted et al. (US6207745).

15. Okano et al. as stated above teaches all of the limitations for claims 1, 4 and 11, except for those limitations listed below.

16. Okano et al. does not teach a laminate comprising a metal layer deposited on a fiber impregnated resin substrate, wherein the insulating substrate resin is polyphthalamide resin, and fibers are selected from titanates, borates and wallastonite.

17. Bersted et al. teaches a flame retardant anti-drip polyamide composition comprising a polyamide, a halogen containing organic compound, and an effective amount of an anti-drip component (column 1, lines 62-65). As the polyamide, a

Art Unit: 1773

copolyamide such as a polyphthalamide is suitable for use (column 4, lines 22-41).

These compositions exhibit excellent fire retardancy, heat resistance, rigidity, and impact strength, and can be molded into various articles via common molding techniques (column 9, lines 9-24). These materials are used in high temperature applications, such as in circuit boards and semi-conductor packaging (column 1, lines 12-20).

18. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to use the polyphthalamide composition taught by Bersted et al. as the polyamide resin used in the circuit board prepreg composition taught by Okano et al.

19. One would have been motivated to make such a modification due to the increase in heat resistance, fire retardance, rigidity, and impact resistance that one would expect to gain as a result.

20. Claims 1, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okano et al. in view of Freeman et al. (US5846309).

21. Okano et al. as stated above teaches all of the limitations for claims 1, 12 and 14, except for those limitations listed below.

22. Okano et al. does not teach a laminate comprising a metal layer deposited on a fiber impregnated resin substrate, wherein the insulating substrate resin contains wollastonite as the fibrous filler and further contains kaolin having a particle size between .1-20 μ m

Art Unit: 1773

23. Freeman et al. teaches a method for manufacturing a coarse particle size kaolin clay which provides good reinforcement properties, flame retardancy, and excellent surface finish characteristics when it is incorporated as a filler into thermosetting compounds (column 2, lines 55-60). The Kaolin clay taught by Freeman et al. has a particle diameter between 4.5-6 μm (column 3, lines 10-20).

24. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate the coarse kaolin clay material taught by Freeman et al. into the thermosetting circuit board prepreg composition taught by Okano et al.

25. One would have been motivated to make such a modification due to the improved flame retardancy and surface finish characteristics one would expect to gain as a result.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhler whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Art Unit: 1773

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.



nju

March 27, 2002



Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700